

WHAT IS CLAIMED IS:

1. An organic electroluminescence display device, comprising:
 - a substrate;
 - a first electrode layer, disposed on the substrate;
 - 5 a second electrode layer, disposed over the first electrode layer;
 - an organic functional layer, disposed between the first electrode layer and the second electrode layer; and
 - at least one electrochromic medium layer, disposed between the first electrode layer and the second electrode.
- 10 2. The organic electroluminescence display device of claim 1, wherein the organic functional layer is disposed over the first electrode layer, and the electrochromic medium layer is disposed between the organic functional layer and the second electrode layer.
- 15 3. The organic electroluminescence display device of claim 1, wherein the electrochromic medium layer is disposed over the first electrode layer, and the organic functional layer is disposed between the electrochromic medium layer and the second electrode layer.
4. The organic electroluminescence display device of claim 1, wherein the organic functional layer comprises at least one organic electroluminescence layer.
- 20 5. The organic electroluminescence display device of claim 4, wherein the organic functional layer further comprises a hole injection layer disposed between the first electrode layer and the organic electroluminescence layer.

6. The organic electroluminescence display device of claim 5, wherein the organic functional layer further comprises a hole transport layer disposed between the hole injection layer and the organic electroluminescence layer.

7. The organic electroluminescence display device of claim 6, wherein the
5 organic functional layer further comprises an electron injection layer disposed between the second electrode layer and the organic electroluminescence layer.

8. The organic electroluminescence display device of claim 7, wherein the organic functional layer further comprises an electron transport layer disposed between the electron injection layer and the organic electroluminescence layer.

10 9. The organic electroluminescence display device of claim 8, wherein the electrochromic medium layer is disposed between any two of the hole injection layer, the hole transport layer, the organic electroluminescence layer, the electron transport layer and the electron injection layer.

10. The organic electroluminescence display device of claim 1, wherein a
15 material of the electrochromic medium layer is at least one selected from a group consisting of transition metal oxide, Prussian compound, viologens, conductive polymer, transition metal, lanthanide coordination complexes, metallopolymers, metal phthalocyanines and a combination thereof.

11. The organic electroluminescence display device of claim 10, wherein the
20 transition metal oxide is at least one selected from a group consisting of WO_3 , MoO_3 , V_2O_5 , Nb_2O_5 , $\text{Ir}(\text{OH})_3$, NiO_xH_y and a combination thereof.

12. The organic electroluminescence display device of claim 10, wherein the Prussian compound is at least one selected from a group consisting of $[\text{Fe}^{\text{III}}\text{Fe}^{\text{II}}(\text{CN})_6]^-$, $[\text{Fe}^{\text{III}}\text{Fe}^{\text{III}}(\text{CN})_6]$, $[\text{Fe}^{\text{II}}\text{Fe}^{\text{II}}(\text{CN})_6]^{2-}$ and a combination thereof.

13. The organic electroluminescence display device of claim 10, wherein the viologens comprises 1,1'-disubstituted-4,4'-bipyridinium salts.

14. The organic electroluminescence display device of claim 10, wherein the conductive polymer is at least one selected from a group consisting of polypyrrole,
5 polythiophene, polyaniline, PEDOT and a combination thereof.

15. The organic electroluminescence display device of claim 10, wherein the transition metal, lanthanide coordination complexes and metallopolymers are at least one selected from a group consisting of metal hydride, nitrosyl, oxo molybdenum complexes, poly-[Ru^{II}(vbpy)₂(py)₂]⁺Cl₂ and a combination thereof.

10 16. The organic electroluminescence display device of claim 10, wherein the metal phthalocyanines comprises [Lu(Pc)₂].

17. A organic electroluminescence display device, comprising:

a first substrate, having a displaying surface;

a first electrode layer, disposed on the first substrate;

15 a second electrode layer, disposed over the first electrode layer;

an organic functional layer, disposed between the first electrode layer and the second electrode layer; and

a selective light valve, disposed over the displaying surface.

18. The organic electroluminescence display device of claim 17, wherein the
20 selective light valve comprises a liquid crystal light valve.

19. The organic electroluminescence display device of claim 18, wherein the liquid crystal light valve comprises a second substrate, a third substrate and a liquid crystal layer, the third substrate is disposed over the displaying surface, and the liquid crystal layer is disposed between the second substrate and the third substrate.

20. The organic electroluminescence display device of claim 18, wherein the liquid crystal light valve comprises a second substrate and a liquid crystal layer, and the liquid crystal layer is disposed between the displaying surface and the second substrate.

21. The organic electroluminescence display device of claim 17, wherein at least
5 one electrochromic medium layer is further disposed between the first electrode layer and the second electrode layer.